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ABSTRACT

This bibliographic review aims to present a single comprehensive source of references to facilitate clinical application of data obtained on the vocal activity of normal infants and to facilitate continued research on prelinguistic vocal output. The bibliography cites the published observational, empirical, and theoretical reports that examine the normal infant's noncry vocalization. Over 300 citations are listed, from the late 1800's to 1987. Citations are restricted to those discussions in which some type of analysis was attempted or completed on infant subjects' actual noncry utterances, whether the analysis was articulatory, acoustic, linguistic, phonatory, descriptive, or behavioral. The bibliography emphasizes studies of normal vocal functioning, but also includes studies that first established a normal baseline against which to compare a selected risk population. Dissertations and presented papers are not included, and only selected chapters are drawn from full-length books on infant vocalization. (JDD)

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Noncry Vocal Production in Infancy: A Bibliographic Review

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Noncry Vocal Production in Infancy: A Bibliographic Review

ABSTRACT

Available census data indicate that there are increased numbers of infants surviving adverse medical complications than in the past. Commensurate with the increased survival rates of at-risk and high-risk infants, communication disorders specialists are more actively involved in evaluating presence or absence of deviant vocal activity of these young children and a typical paradigm for the diagnostic process is to compare the at-risk child with the normally developing infant. Concurrently, there has been long-standing theoretical interest in how normal children come to speak and whether there is a relationship between prelinguistic vocalization and later expressive speech. The specific aim of this review is to present a single comprehensive source of references that will be clinically and experimentally useful to facilitate clinical application of data obtained on normal infants and to facilitate continued research on prelinguistic vocal output. A bibliographic format is employed to summarize, from an historical perspective, the published observational, empirical and theoretical reports that examine fundamental issues of the normal infant's noncry vocalization. The review covers the period from the late 1800's to 1987.

Running Head: Infant Vocalization; Noncry Vocalization; Prelinguistic Vocalization; Preverbalization

Noncry Vocal Production in Infancy: a Bibliographic Review

Introduction and Purpose

In recent years, there has been an increased emphasis on the study of infant vocalization. On one hand, there is a higher percentage of at-risk and high-risk infants surviving adverse pre-, peri- and postnatal conditions who require early intervention programs that include the communicative disorders specialist as an integral participant (Enser and Clark, 1986; Rossetti, 1986). On the other hand, there remain theoretical interests in how normal children come to speak their native language and whether there is a relationship between preverbal vocal activity and speech produced after the child has acquired meaningful language.

A typical paradigm for studying and subsequently planning early intervention for the at-risk or high-risk baby is to utilize a known data base obtained on normal children for the purpose of comparing the 'abnormal' against the 'norm'. In addition, information on vocal and communicative acts of nonrisk children is often employed to normalize vocal communication and social interactions of children at-risk. The term 'at-risk' is used synonymously with developmentally impaired, developmental delay, handicapped and special needs. Broadly, at-risk describes those infants who suffered prenatal, perinatal or neonatal medical complications which may contribute to later delays or deficiencies (Bricker, 1986; Field, Sostek, Goldberg and Shuman, 1979). Tjossem (1976) reported three different types of risk conditions suggesting that the term 'born at-risk' may refer to infants who have the potential for aberrant behavior due to organic

and/or environmental factors.

The term 'infant' is typically used to describe the child who is chronologically between birth and 12 months of age. In Latin, 'infans' stands for 'not speaking'. Consequently, the literal definition of infant infers the absence of speech and expressive language (McCarthy, 1929; Trevarthen, Murray and Hubley, 1981) and the terms infant, baby and child are used synonymously to refer to the young human between 0 and 12 months old. Inasmuch as it is recognized that the 0 to 12 month age range encompasses several developmental periods (Piaget, 1952) and stages of vocal development (Oller, 1980; Stark, 1980), sources selected for citation in this review may discuss noncry vocal development through ages and stages where the child actually produces speech and expressive language.

Since different types of sounds occur in the infant's vocal repertoire, attempts to define the vocal output produced during infancy have resulted in discrepancies where cry and noncry vocalizations are not always differentiated. While cry and noncry sound patterns are believed to be morphologically and functionally related, spectrographic analyses (Wolff, 1969; Stark and Nathanson, 1974) indicate that there are also acoustic and auditory differences. Both cry and noncry vocalizations are biobehavioral signals with considerable communicative value, however, the manner in which the listener perceives and responds to each vocal type varies. Most often, noncry or nondistress sounds are interpreted as positive vocalizations and are generally thought of as 'social responses' (Anderson, 1977, p. 86). Alternatively, cry sounds are usually associated with some type of displeasure such as hunger or pain. Cry and noncry/nondistress vocalizations may be viewed as separate vocal

activities that are generated by the same physiological source, but vary relative to length of production, pitch characteristics and loudness levels. It is unclear whether or not both vocal types contribute to later articulate speech. The terms neutral, vocal play, comfort and babbling are expressions frequently applied to label noncry utterances. Although cry and noncry productions are both acoustically complex, noncry vocal activity signals less distressful conditions than cry sounds and noncry sounds tend to elicit some type of reciprocal vocal-verbal activity from the listener (Freedman, 1974; Stark, 1986).

There is evidence documenting an interest in infant noncry vocal development since 1787 (Murchison and Langer, 1927). Over time, there have been numerous speculations, theories and descriptions concerning the normal infant's vocal activity. Prominent among the anecdotal, observational, theoretical and empirical explorations on how children come to talk has been the question of whether there is a prelinguistic-to-linguistic continuum (continuity hypothesis) or whether such a continuum is, in fact, a reality (discontinuity hypothesis). To account for the dynamic nature of infant noncry vocalizations, investigators have examined the baby's vocal output by proposing different stages of acquisition and positing potential cognitive-prelinguistic-linguistc relationships. Attempts at resolving some of the questions surrounding infant vocal development have also taken primarily physiological and/or neurological approaches with the aim of ultimately correlating selected physical aspects of development with linguistic factors.

Clearly, there are a number of unanswered questions about noncry vocal development during the first year of life. For example, is

there a relationship between vocal types produced preverbally and later expressive speech? Impinging on other long-standing questions such as how do we reliably describe and classify infant vocalization are new and competing theories of phonological development that seek to determine the existence and probable influence of cognitive variables. To enhance understanding, to facilitate clinical application of normal vocal development in the prelinguistic period and to facilitate continued experimental work on normal noncry vocalization, the overall purpose of this article is to use a bibliographic format to summarize, from an historical perspective, observational, empirical and theoretical reports that examine fundamental issues on infant noncry vocalization. The review covers a period from the late 1800's to 1987. The specific aim of the article is to present a single comprehensive source of references that will be experimentally and clinically useful in the continued examination of infant noncry vocalization.

Since there is a range of descriptive and empirical work on infant vocal output, published across several different disciplines, the chronological age criterion of 0 to 12 months was employed as a convenient means of prioritizing and selecting from the number of studies on normal noncry vocalization. Citations are also restricted to those discussions in which some type of analysis was attempted or completed on infant subjects' actual noncry utterances. This means that some type of articulatory, acoustic, lingustic, phonatory, descriptive or behavioral analysis was applied to quantitatively and/or qualitatively characterize vocalization. Although this review emphasizes studies of normal vocal functioning, there are studies that first established a normal baseline against which to compare a

selected risk population. When such studies were identified, they were included in the list of resources because of the presentation of normal vocalization data. To maintain a manageable page length and to present resources that would be readily accessible to the reader, dissertations and presented papers were not included and only selected chapters were drawn from full length books on infant vocalization. Complete books on infant vocalization are noted with two asterisks ( ) at the end of the citation.

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